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been discovered by G. Eisen in a small rapidly flowing spring among the snowy peaks of the Sierra Nevada in California. The worm is described in a memoir, with two colored plates, in the Transactions of the Royal Society of Sciences in Upsala, for 1881. The worm is named *Eclipidrilus frigidus*, and the family Eclipidrilidæ.—The second part of M. Jules Macleod's contribution to the study of the structure of the ovary of Mammals refers to that of Primates. He has also published in the Bulletin of the Academy of Sciences of Belgium, abstracts of the results of his investigations on the reproductive apparatus of bony fishes, especially the ovary of Hippocampus and of Sygnathus.—It will be remembered that elephantiasis and other diseases allied to leprosy are supposed by Dr. Lewis and others to be contracted in India and China from drinking unfiltered and unboiled water containing the embryos of Filaria, minute thread worms found in the circulation of leprosy patients, which are introduced into man by drinking cold uncooked water, as well as by the mosquito, which serves as an intermediary host. Dr. P. Manson, of Amoy, has published in the Journal of the Queckett Microscopical Club, a notice of a chart recording a series of observations on the blood, temperature and pulse of two Chinese lads, ascertained to be filarious, and which were in the main made by themselves. He concludes, 1st, that the periodicity observed by the Filaria embryos is by no means an exceptional or capricious phenomenon; and 2d, that it is associated with the advent of night, not depending in any way on the sleeping state. Dr. Manson concludes as follows: "If the examination of filarious blood is made during the night, it is almost as easy to find the parasite as it is to find a white blood corpuscle. Seeing this, and the frequency with which the presence of the parasite is associated with lymphatic fever, elephantoid and other disabling affections, I have sometimes thought it would be worth the trouble for the government in India to institute the systematic examination of the blood of native recruits by their medical officers."—In the same periodical Mr. J. G. Waller argues that the so-called boring sponge (*Cliona*) does not make the burrows in which it is found growing, but that an Annelid is the factor. To this Mr. Priest demurs, who claims what is generally accepted by zoölogists, that the *Cliona* does the work. He thinks the protoplasm of the sponge acts on the surrounding parts, and eats its way into them, as the protoplasm of necrosis eats into bone.

ENTOMOLOGY.¹

THE PERMANENT SUBSECTION OF ENTOMOLOGY AT THE RECENT MEETING OF THE A. A. S.—The Entomological Club of the A. A. S., which has had several most interesting and instructive meetings, was made a permanent subsection of the Associa-

¹ This department is edited by PROF. C. V. RILEY, Washington, D. C., to whom communications, books for notice, etc., should be sent.

tion at Boston last year, and with the adoption of the amendments to the constitution at Cincinnati, has become part of the Section (F) of Biology, and will meet in future, when the number of entomological papers will warrant, as a subsection thereof. At the recent meeting there were few papers presented; indeed, but a single title had been entered up to the first day, and the editor of this department, who had decided to enter none, owing to his duties as general secretary, was induced to change his mind, upon this discouraging showing. The distinctive feature of the club was its meeting a day in advance of the Association, when excellent opportunity was offered for the interchange of views and the exhibition and exchange of specimens. After the business of the Association once begins, there is so much to interest and occupy members that it is more difficult for the specialists to get together. In this one respect the merging of the club into the Association—the loss of its independence, so to speak—is a drawback; but we hope that it will not lessen the enthusiasm or interest of the entomologists of the country, who still have in the Association an incentive to annual reunions that cannot but prove both pleasant and profitable.

Among those in attendance were the chairman, Jno. G. Morris, the secretary, B. Pickman Mann, and Messrs. J. A. Lintner, Wm. Saunders, Wm. H. Edwards, J. D. Putnam, Cyrus Thomas, V. T. Chambers, S. H. Peabody, H. S. Jewett, Charles Dury, A. J. Cook, C. G. Siewers, Jno. A. Warder, C. D. Zimmermann, E. W. Claypole.

The following is a list of the papers entered and read:

- Life-history of the Buckeye stem-borer, *Sericoris instrutana* Clem. E. W. Claypole.
- Retarded Development in Insects. C. V. Riley.
- New Insects injurious to American Agriculture. C. V. Riley.
- The Egg-case of *Hydrophilus triangularis*. C. V. Riley.
- On certain habits of *Heliconia charitonia*. W. H. Edwards.
- On the Oviposition of *Prodoxus decipiens*. C. V. Riley.
- The Cocoon of *Gyrinus*. C. V. Riley.
- On the length of life of Butterflies. W. H. Edwards.
- On the life duration of the Heterocera (moths). J. A. Lintner.
- A remarkable invasion of Northern New York by a Pyralid insect, *Crambus vulgivagellus*. J. A. Lintner.
- On an alleged abnormal peculiarity in the history of *Argynnis myrina*. W. H. Edwards.
- How does the Bee extend its Tongue. A. J. Cook.
- The Syrian Bees. A. J. Cook.
- Carbolic acid as a preventive of Insect Ravages. A. J. Cook.
- Suggestions of coöperation in furthering the study of entomology. B. Pickman Mann.

The subsection was opened by the reading of Mr. Edwards's paper on a singular habit of *Heliconia charitonia* Linn., recently observed by Dr. Wm. Wittfeld, near Indian river, Fla. In two in-

stances Mr. W. found three or four of these butterflies brooding, so to speak, over a chrysalis of the same species, clinging to it tenaciously by their legs, and resenting all attempts to frighten them away until the imago had issued from the chrysalis. This brooding would last for two or more days. We know of no similar action of a butterfly on record, and the statements elicited from Mr. Edwards in the discussion of his paper, left the impression that the butterflies could not have congregated around an injured chrysalis to obtain its juices, but that they really gathered around it for protection, on the hypothesis that the imago possessed some peculiar immunity from the attacks of birds and other enemies not possessed by the chrysalis. If this hypothesis should in future prove to be correct, the action of this species will denote a remarkable degree of intelligence in butterflies.

In the afternoon the genial and venerable president read his address, which contained feeling tributes to those entomologists who passed away during the year, and an admirable bibliography of the writings of the year by American entomologists. His allusion to the death of Professor S. S. Haldeman was quite tender, giving some reminiscences of years ago, when he and Haldeman were very intimately associated in favorite studies. He rapidly sketched some leading features of the scientific life of his late friend and delivered a eulogy upon his character appreciated by all who had any acquaintance with him.

Dr. M. also gave a sketch of the condition of entomology as it was 40 years ago, when there were not known to be more than 10 or 12 working entomologists in the country, whose names he enumerated. At present, there are 436 names reported in last year's Naturalists' Directory of persons who are designated as entomologists. There is no other distinct branch of zoölogy that has so many representatives in that book except geology and botany. The lists of all contributions to entomology for the last year in the various journals, exclusively by American writers, numbered 336, and of writers 80.

Mr. Edwards's paper "On the length of life of butterflies," showed, from his own experience of fifteen years, that the life in the imago state, in summer, spans but a few weeks, depending somewhat on the period when coition occurs; while those which hibernate as imagines may of course endure eight or ten months. Citing *Danaïis archippus* as an illustration, he criticised the statement in reference to it in Mr. Scudder's recent work on butterflies, where Archippus is made to live from twelve to fifteen months, and to oviposit only after hibernation. Mr. Edwards's experience shows that in West Virginia the broods of Archippus follow in quick succession to the number of three or four, and that during the summer the eggs are laid by young females soon after issuing from chrysalis. Mr. Riley stated that his experience in reference to this species in the Southwest, corroborated that of Mr. Ed-

wards, and expressed the belief that it did not hibernate at all in the Northern States but migrated to the South in autumn, and dispersed northward the ensuing spring and summer, and suggested that this fact, not appreciated by Mr. Scudder, would throw light on the history of the species in New England.

Mr. Lintner's paper on a somewhat similar subject, viz., the life duration in Heterocera, gave a long series of careful notes of collectings, from which he concluded that the average duration of moths is from two to three weeks in summer. The paper gave rise to some extended remarks from Messrs. Thomas, Mann, Riley and others. Mr. Thomas thought that the knowledge of the term of life in the imago was of less value, from an economic standpoint, than that of the individual in all its states. In endeavoring to ascertain this duration in *Leucania unipuncta*, he had come to the conclusion that it was about seventy-seven days. This conclusion, based on calculations from recorded appearances of the insect, was in opposition to the only actual experiments which are on record, viz., those by Mr. Riley in the Eighth and Ninth Reports on the Insects of Missouri, which show that the term of life in summer hardly extends over half as many days. In fact, all our experience as to the summer duration of life in this species shows that each state of egg, larva, chrysalis and imago will average ten days. Mr. Thomas argued that insects in confinement develop more rapidly than in freedom. Mr. Riley gave his experience as opposed to the statement: insects reared in confinement during the summer are likely to develop more slowly than in freedom, for the obvious reason that those in freedom get more sunlight, and constantly have a supply of fresh food at hand, and this will hold equally true with the changes that take place underground, for the mean temperature of the soil, during summer, is evidently greater outdoors than indoors. Experience shows, moreover, that in this question everything depends on the time of year, character of the weather and other surrounding conditions, there being a wide range in the duration of life in the same species.—*(To be continued.)*

THE NEW IMPORTED CLOVER ENEMY.—In the September number we gave a brief record of the appearance in injurious numbers of *Phytonomus punctatus* Fabr., a common European Curculionid hitherto unknown in this country. In looking up the literature on the habits of the insects of this genus in Europe, we find much written on the history of the earlier states of several species. From what is known in Europe, it appears that the species of the genus show a unity of habit and mode of development. The greenish larvæ (recalling in general appearance those of *Syrphus* or of some *Tenthredinid* larvæ), feed in May and June on the leaves and flowers of the plants they infest, and spin in July a net-like cocoon on various parts of the plant, changing therein to

pupæ within eight to twelve days, the beetle issuing in July or August. Only one annual generation is recorded, the beetle hibernating. *Phytonomus murinus* Fabr., oviposits on the young shoots of Lucern (*Medicago sativa*); *Ph. meles* Fabr., feeds as larva and beetle on *Trifolium pratense* and Lucern, and proves injurious to the latter plant in some parts of Germany; *Ph. nigrirostris* Fabr. (which, by the way, occurs also, though rarely in the United States, from Canada and Massachusetts westward to Michigan), feeds as larva on *Trifolium pratense* and *Bupththalmum salicifolium*; *Ph. pollux* Gyllh. on *Silene inflata* and *Polygonum hydropiper*; *Ph. rumicis* Fabr., on various species of Rumex and also on *Polygonum aviculare*; *Ph. viciæ* Gyllh. on *Vicia sylvatica*; *Ph. plantaginis* DeG. on *Platago lanceolata* and *Lychnis dioica*; *Ph. polygoni* Linn., on young shoots of Dianthus and on *Polygonum aviculare*, the larvæ feeding on the leaves as well as on the blossoms and also boring in the stems; *Ph. suspiciosus* Hbst., on *Lotus uliginosus* and *Lathyrus pratensis*; *Ph. palumbarius* Germ., on *Mentha aquatica* and *Salvia glutinosa*. So far as known, the habits of the genus in this country conform to the above experience in Europe. We have reared *Ph. comptus* Say, from *Polygonum nodosum* upon which the larvæ and pupæ may be found in July, the cocoon having the usual net-work appearance. Of the nine species known to occur in this country (exclusive of *Ph. punctatus*) this is the only one whose habits have been observed, though, as above shown, those of *Ph. nigrirostris* have been recorded by European observers.

We had the pleasure of spending some time about the middle of August with Mr. L. D. Snook at Barrington, N. Y., who has suffered materially from the attacks of *Phytonomus punctatus*, and since—though it is so common abroad—little or nothing is on record of its habits, and since it has certainly never before been reported as injurious to agriculture, we give Mr. Snook's experience up to the time of our visit. In the latter part of April, he first noticed on a field of clover here and there, small patches where the leaves were badly eaten. The damage increased rapidly in extent, and by the end of July, the whole field (about seven acres) was badly infested, one corner of nearly two acres having scarcely a whole clover leaf remaining. Other fields in the neighborhood were attacked in the same manner, while an occasional field escaped injury. We found acres of his clover ruined, but in passing through the field none but an expert would suspect the cause, since the beetles were, as a rule, hiding on the ground or slightly beneath the surface, and the few that were feeding dropped and "played possum" upon the slightest approach, their color being so much that of the earth, that they are not easily observed. That they had been much more numerous earlier in the season than they then were, was apparent from the number of dead specimens more or less broken, and from the

cocoons which had generally been washed by the rains on to the ground and more or less embedded. Judging from European experience we anticipated no further multiplication the present year; but, to our surprise, the beetles have been continuously laying eggs from that time to the present writing (October 3d), and what is more singular, while some of the eggs have been laid externally to the plant either singly or in little groups, most of them have been secreted and thrust into the old and hollow stems. A few of the larvæ which hatched externally are now nearly full-grown, but those which hatched within the stalk, have fed but little and are evidently preparing for hibernation. Is this a normal habit in Europe, or is it a departure therefrom consequent upon the introduction of the species here? The latter seems quite probable since the habit of attacking clover injuriously is certainly new, if we may judge from the failure to indicate it by European entomologists. The probability is that the insect with us will hibernate both in the larva state within the stem and in the beetle state. In either event the larvæ will doubtless be found most numerous in northern New York in the month of May, and we recommend that clover fields in which it is found be heavily rolled at that season, as the best means of decreasing its injuries.

Without going into descriptive details, we would state that the egg is elongate-oval, about twice as long as wide, pale yellow, and smooth when first laid, but becoming greenish-yellow, and roughened with hexagonal depression before hatching. The average length is 1^{mm} and in most cases the larva has hatched in about one week from the time the egg was laid. The young larva is pale with a dark head, but subsequently becomes greenish with a distinct whitish medio-dorsal line relieved by darker shades each side. The body is deeply wrinkled, with prominent substigmatal and ventral swellings, the latter so well developed and so extensile that they perform the function of prolegs, giving the larva its strong resemblance to those of *Tenthredinidæ*, and enabling it to easily crawl or clasp the edge of a leaf. When at rest it clings sideways and in a curved position to the leaf, usually on the underside, grasping the leaf hairs between the ventral swellings but especially in the transverse fold of the anus, by which it can hold and swing the whole body about as *Syrphid* larvæ are known to do. The surface of the body is sparsely beset with short stiff hairs, varying in number at different stages of growth. The largest specimen, evidently about full-grown, has up to this writing (October 3d) experienced three molts.—*C. V. Riley*.

CRAMBUS VULGIVAGELLUS.—This common moth which, as stated on page 750, is the parent of the worms that did so much damage to meadows in parts of New York. (See pp. 574 and 576.) has been excessively abundant all over the Eastern States this

year, and as Mr. Henry Edwards informed us, proved a positive nuisance in collecting in the neighborhood of New York city. Professor Lintner has published a full account of it in the *Elmira Husbandman* for Sept. 14, 1881, in a paper presented to the N. Y. State Agricultural Society. He has also obtained the eggs, and from them a second brood of larvæ. We found the egg-shells quite common in the earth from some sward sent September 12th, by Mr. Adams, from a field that had been devastated by the larva, and we have since readily obtained fresh eggs from moths captured in Washington. The eggs are pale yellow when laid, but become orange afterward; they are elongate-oval, very slightly broader at base than at top, and ribbed as in those of various butterflies, there being about twenty longitudinal, rather sharp ridges and about thirty less marked transverse ones. The average length is 0.7^{mm} and diameter 0.3^{mm} . They are dropped singly among the grass and on the ground.—C. V. R.

LARVAL HABITS OF SPHENOPHORI THAT ATTACK CORN.—For many years several species of the genus *Sphenophorus* have damaged the corn crop in various parts of the United States, more particularly at the south, where they are all known as "bill bugs." Glover, in 1855, spoke of their injuries, but did not determine the species. Walsh, in 1867 (*Pract. Ent.*, II, 117), described a species damaging corn in New York as *S. zea*, but which subsequently proved to be *S. sculptilis* of Uhler. *S. sculptilis* also occurs in the South and West, being common in Illinois and Missouri. It has also been received at the Department of Agriculture from Florida and Alabama, *S. robustus* from South Carolina, and *S. parvulus* from Missouri, all as injuring corn. The larval habits of all these species are unknown. Walsh surmised that *S. sculptilis* would be found to breed in decaying driftwood washed by water, the adults migrating to neighboring corn-fields, and some subsequent facts that have come to our knowledge lend weight to his hypothesis so far as this particular species is concerned.

In reference to one of the larger species (*S. robustus* Horn), which has done considerable injury to corn this year in South Carolina, Mr. L. O. Howard, whom we recently sent down there to study it, found that it actually breeds in corn. On the plantations along the bottom-lands of the Congaree and neighboring streams, as soon as the corn appears in the spring it is attacked by numbers of the adult beetles. Stationing themselves at the base of the stalk, and also burrowing slightly under the surface of the earth, they pierce the stalk and kill many plants outright, leaving others to grow up dwarfed and distorted. The whole field has frequently to be plowed over and replanted. The eggs are probably laid at this time or a little later, at or near the surface of the ground. The young larva, hatching, works downwards, and may be found at almost any age in the tap-root. A few individ-

uals work upwards into the first section of the stalk, but only, it would seem, after having consumed all available pith below ground.

At full growth the larva will have consumed the pith of the stalk for from four to five inches, dwarfing the stalk, preventing the make of the ear, and causing the lower leaves to turn brown and wither. The larva has the general characters of other described larvæ of the genus. The pupæ are found in cavities opposite the first suckers, surrounded by excrement compactly pressed so as to form a sort of cell.

The beetles make their appearance in the fall (one specimen issued as early as August 30), and hibernate as adults mainly in the stalks. The remedy then of cutting the stalks in fall or early winter and of plowing up and burning the stubble is obvious.—*C. V. Riley.*

EFFECT OF DROUGHT ON THE HESSIAN FLY.—It has long been known that the Hessian fly flourishes most when the Chinch bug flourishes least; in other words, that wet weather favors it. Moisture seems essential to the well-being of the larva. The prejudicial effect of drought has not hitherto been observed, that we are aware of, but was very noticeable the present year in parts of Ohio, where the puparia literally dried up. Our attention was first called to the fact of the general death of the insect in the "flax-seed" state by Mr. E. W. Claypole, of Yellow Springs, O., and our observations subsequently confirmed his experience. The intense heat had not only desiccated the *Cecidomyia*, but, what is still more remarkable, in most cases the parasites also. We should like to hear from Prof. Cook, of Michigan, and others, whether a like result followed the severe heat and drought in other parts of the West. The presumption is that the mortality was general and that farmers may expect immunity from injury for some years to come.

SIMULIUM FROM LAKE SUPERIOR.—In regard to the *Simulium* from Lake Superior, which we mentioned on p. 313, current volume of this magazine, Dr. Hagen remarks in the *Canadian Entomologist* (Vol. XIII, pp. 150-151), that upon examination of larvæ and pupæ, sent to him by Mr. H. G. Hubbard, they did not appear to differ materially from those of *S. pictipes*, but that the imagines from Lake Superior (which were not raised from the pupæ collected by Mr. Hubbard) differ from *S. pictipes* in their much smaller size and in the color of the legs.

COLEOPTEROUS CAVE FAUNA OF KENTUCKY.—Mr. H. G. Hubbard has carried on during the past summer a careful investigation of the insect fauna of the different caves in Kentucky, especially near Cave City, and it is now pretty safe to say that the Coleopterous cave fauna of Kentucky comprises but two general viz: *Adelops* and *Anophthalmus*. Of the former genus only one

species has been found which seems to be equally common in all caves in that State, but Mr. Hubbard thinks that in *Anophthalmus* we may expect considerable increase in the number of species when all our caves shall have been explored.

HEMIPTEROLOGICAL STUDIES.—Dr. V. Signoret kindly sends us the first part of his "Revision du groupe des Cydnides de la famille des Pentatomides," from the *Annales de la Société Entomologique de France* for 1881. It contains a review of what has been done in the classification of this family by former authors, a characterization of the family, table of genera (forty-three in number) and the beginning of the description of the species from all parts of the globe. Two plates accompany this part.

ENTOMOLOGY IN BUFFALO, N. Y.—We are very glad to see that the publication of the Bulletin of the Buffalo Society of Natural Sciences has been resumed after a lapse of several years. Vol. IV, No. I, has just been issued and contains the following entomological papers: List of Coleoptera observed and collected in the vicinity of Buffalo, by F. Zesch and O. Reinecke; New Coleoptera, by John L. LeConte, M.D. (*Elaphidion imbellis*, *Oeme gracilis*, both from Poway, Cal., and *Myodites zeschii*, from Buffalo); Observations and Notes (on *Eudryas unio*, *Smerinthus modesta*, *Hylesinus trifolii*, *Cossus robiniae*, *Papilio thoas*, *Thyreus abboti*). One plate accompanies this number, but we must confess that figures III and IV thereof are quite poor and inaccurate.

LAMPYRIDÆ.—Dr. LeConte has been kind enough to send us a copy of his long-expected "Revision of the N. A. Lampyridæ." This paper will no doubt be very welcome to every coleopterist in our country, as it renders determinations possible in a somewhat neglected but interesting group of beetles. We hope that it will serve to call attention to the many interesting points in the life-history of the Lampyridæ proper, yet to be made out.

SEVERE COLD AND HIBERNATING APPLE-WORMS.—Prof. A. J. Cook records having found that the larvæ of *Corpocapsa pomonella*, which hibernated under natural conditions, *i. e.*, in their silken cocoons in the cracks and crevices of the trees, had succumbed to the severe cold of last winter, while those hibernating in cellars and kitchens survived.

ANTHROPOLOGY.¹

TEMPORAL PROCESS OF THE MALAR BONE IN ANCIENT HUMAN CRANIA.²—A noteworthy anatomical and possibly anthropological feature of a large proportion of the crania from the well-known ancient cemetery near Madisonville, Ohio, is the presence of a

¹ Edited by Prof. OTIS T. MASON, 1305 Q Street, N. W., Washington, D. C.

² The Temporal Process of the Malar Bone in the ancient human crania from Madisonville, Ohio, by F. W. Langdon, M.D. Read before Am. Assoc. for the Adv. of Science, at Cincinnati, Aug. 22, 1881.